

ABSTRACT

This sixty-day trial was conducted to analyze the impact of onion peel powder (OPP) on the growth rate, nutritional value, and hemato-biochemical parameters in rohu (*Labeo rohita*). The experiment consisted of five treatment groups supplemented with graded levels of OPP for rohu 4.12 ± 0.27 (initial body weight mean \pm standard deviation). Control group contain 0% onion peel powder, OPP0.5 group contain 0.5%, OPP1 group contain 1%, OPP1.5 contain 1.5%, and OPP2 contain 2% onion peel powder in 100% basal feed prepared for rohu. In the sixty-day trial, initial and final data were collected, assessed, and the obtained results were analyzed using Statistix-9.1. One-way ANOVA – analysis of variance was used to determine if the independent variables have any significant impact on the dependent variables. When a statistical difference was detected, Tukey's HSD test was used to compare the averages of the treatment groups. The statistical results showed that improved gain in weight, SGR%-specific growth rate%, FI-feed intake, FCR-feed conversion ratio, and FE-feed efficiency were observed in the OPP1 group with 1% OPP ($p < 0.05$). The body chemical composition results showed dry matter and lipids were maximum ($p < 0.05$) in OPP2 group (with 2% OPP) and less in OPP1. Protein and ash content were high in the OPP1 group. The ALT and AST levels were found high ($p < 0.05$) in the OPP2 group which contained highest amount of the dietary supplement, showing that the 2% OPP induced stress in rohu. Plasma total protein and triglycerides improved up to 1% OPP and then these parameters showed an imbalance at the maximum supplementation of 2%, indicating that the higher amount of the herb adversely affected the biochemical health aspects in rohu. Blood profile showed a significant improvement in RBCs, Hb, and Hct except basophil and eosinophil ($p > 0.05$). The erythrocytes and related aspects greatly improved in the OPP1 group but declined at the 2% OPP. Contrary, the total leukocyte count with neutrophils and monocytes increased ($p < 0.05$) at the 2% OPP while lymphocytes declined ($p < 0.05$) at the 2% OPP possibly due to the decline in plasma total protein.

Lymphocytes have a role in adaptive immunity; this decline shows that fish showed a strong innate immune response at the expense of its adaptive immunity. The findings of this study represented that incorporating an optimum level of onion peel powder into the basal diet for rohu could have positive impact on growth, proximate composition, chemical composition and hematological parameters in rohu. The optimum value of onion peel powder for high growth rate, improved feed efficiency, biochemical and hematological parameters was estimated as 1% OPP in a 100% basal diet for rohu. This study provides us promising findings on the incorporation of thrown parts from the food and agriculture industry into aquafeed to obtain the growth and health promoting effects of the several important nutrients present in such waste components, ensuring economic, environmental, and social sustainability.

Keywords: *Allium cepa*, Functional feed, Food security and food safety, Performance, Rohu